EDITORIAL

Thrombosis

The recent publication\(^1\) by the National Academy of Sciences of the papers presented at the Conference on Thrombosis occasions an examination of the state of science and science policy relating to thrombosis. The Conference was unique in providing a broad survey of the problem from its more basic biological aspects to its public health significance. From such a scrutiny, thrombosis emerges as an enormously important disease entity, perhaps the most important factor contributing to morbidity and mortality of our adult population.

To place thrombosis in proper perspective, it is interesting to compare it with other biological enigmas which also represent major health problems. The problems of neoplasia are in many ways comparable. Biologically, both thrombosis and neoplasia are aberrations of important normal survival mechanisms; both are failures of homeostatic mechanisms whose functional details are not clearly understood. Clinically, the two processes are alike in having as targets all the major organs and systems of the body. And, in the public health sense, the two problems are of similar magnitude, although if one admits a major role for thrombosis in myocardial infarction, stroke, and a variety of peripheral vascular diseases, it appears a more important public health problem than cancer by one or two magnitudes. Both disease processes, although by no means confined to older age groups, are being progressively magnified in importance by the increasing longevity which presently characterizes western civilization.

Despite the biological, clinical, and public health equivalencies discernible in the problems of neoplasia and thrombosis, the course of science policy for the two is in marked contrast. On the one hand, we see a worldwide proliferation of lay unions, professional societies, research institutes, and special hospitals for cancer. These serve to expose the problems, to arouse public and scientific interest, and to mobilize resources for the pursuit of solutions. No such organized institutional attack on the problems of thrombosis exists. Again, special hospital wards and clinics and medical school departments of oncology are in existence, but no such clinical recognition is given to the homogeneity of the thrombosis problem. Indeed, there is no discipline of “thrombology,” and thromboembolic disease is diagnosed and treated by the organ specialist (cardiologist, neurologist, etc.) whose senses are fixed on the target organ and its responses rather than on the aberrant biological mechanism itself. Thus, at both institutional and clinical levels there is diffuseness of effort.

A similar diffuseness is apparent in research, wherein the several lines of relevant investigation have tended to follow dissociated courses separated by
disciplinary lines. The great advances in the science of blood coagulation have been based largely on in vitro observations, but thrombus formation involves much more than coagulation. The roles of blood platelets, the vascular surface, fibrinolysis, and the flow properties of blood have only recently received the attention they merit. But the interrelationships remain obscure. And at present it is not possible to describe with confidence the pathogenesis of a thrombus or to distinguish between the pathogenesis of an arterial thrombus and a venous one or to quantify the roles of the contributing factors.

It would seem that a thrombus, whether occurring in a coronary vessel, cerebral artery, peripheral vein, or in the microcirculation, is a manifestation of a single aberrant process and the differences incurred by the peculiarities of the site can only be considered modifiers of the basic process. So long as coronary thrombosis is looked upon as a disease of the heart and cerebral thrombosis as a disease of the brain, so long will their management remain symptomatic and supportive for the target organ, rather than specific, preventive, and corrective for the common aberrant mechanism. Perhaps the division and thrust of our scientific and clinical efforts need reorientation to focus on the totality of the biological enigma and the homogeneity of the clinical problem. And surely it is time to mobilize financial and appropriate institutional resources for a more forthright attack on the research, clinical and public health problems posed by thrombosis.

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